



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/099,684	03/15/2002	Bradley L. Quist	139.075US1	4938

7590

09/05/2003

Schwegman, Lundberg,
Woessner & Kluth, P.A.
P.O. Box 2938
Minneapolis, MN 55402

EXAMINER

NGUYEN, SANG H

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 09/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/099,684

Applicant(s)

QUIST, BRADLEY L.

Examiner

Sang H Nguyen

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4, 5, 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

The formal drawings have been received and entered on Paper No. 3 filed on 10/5/02. These formal drawings are approved by the Examiner.

Specification

Applicant is reminded of the proper content of an Abstract of the Disclosure.

In chemical patent abstracts for compounds or compositions, the general nature of the compound or composition should be given as well as its use, e.g., "The compounds are of the class of alkyl benzene sulfonyl ureas, useful as oral anti-diabetics." Exemplification of a species could be illustrative of members of the class. For processes, the type reaction, reagents and process conditions should be stated, generally illustrated by a single example unless variations are necessary.

Complete revision of the content of the abstract is required on a separate sheet.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2877

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 16-23, and 28-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki (U.S. Patent No. 5,995,220).

Regarding claims 1, 16-23, and 28-30; Suzuki discloses a method and a machine vision system for inspecting imaging of an object; comprising:

- the object considered to be a semiconductor device (1 of figure 3) having a first side considered to be a left lead (Ln of figure 3) and a second side considered to be a right lead (Rn of figure 3);
- an imager considered to be a camera (5 of figure 3); and
- an optics apparatus considered to be a lens system (6 of figure 1) and dichroic prism (7 of figure 1) or Dove prism (13 of figure 3) for imaging at least two view of optical paths (A, B, C of figure 3) of the first side (Ln of figure 3) of the object (1 of figure 3) without interference (figure 3) from the second side (Rn of figure 3) of the object (1 of figure 1).
- Wherein the optics apparatus ([6,7 of figure 1] or [13 of figure 3]) for imaging a top-down view of the object (1 of figure 3) having both the first side (Ln of figure 3) and the second side (Rn of figure 3) of the object (1 of figure 3) and a separate first side view (A, B, C of figure 3) of only the first side (Ln of figure 3) of the object (1 of figure 1) and a separate second side view (D, E, F of figure 3) of only the second side (Rn of figure 3) of the object (1 of figure 3).

See figures 1-6.

Regarding claim 2; Suzuki discloses the at least two image views (A, B, C of figure 3) of the first side of the object are from orthogonal angles (see figures 3).

Regarding claim 3; Suzuki discloses the at least two image views (A, D of figure 5) of the second side of the object are from different angles (see figure 5).

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 31-35 are rejected under 35 U.S.C. 102(a) as being anticipated by Chow et al (U.S. Patent No. 6,518,997).

Regarding claims 31-35; Chow et al discloses the claimed invention as a method for obtaining a machine vision image of an object, comprising:

- blocking a first portion of the object (15 of figure 1) with a first illuminated surface considered to be electronic light shutters (60,62 of figure 1);
- imaging a second portion of the object using back light from the first illuminated surface by an image capturing device (40 of figure 1 and claim 44);
- blocking the second portion of the object (15 of figure 1) with a second illuminated surface considered to be electronic light shutters (60,62 of figure 1); and
- imaging the first portion of the object using back light from the second illuminated surface by an image-capturing device (40 of figure 1 and claim 44). Figures 1-6.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-10, 12-15, and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (U.S. Patent No. 5,995,220) in view of Toh et al (U.S. Patent No. 6,242,756).

Regarding claims 4 and 24; Suzuki discloses the all of features in claimed invention except for a divider background surface placed at the first major surface of the object in order to obtain separate images of features of the object only on the first side of the object and features of the object only on the second side of the object. However, Toh et al teaches that it is known in the art to provide a divider background surface considered to be a transparent guide (77 of figure 11) placed at the first major surface of the object (71 of figure 11) in order to obtain separate images of features of the object only on the first side of the object (figure 11) and features of the object only on the second side of the object (figure 11). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine machine vision system of Suzuki with a divider background surface placed at the first major surface of the object in order to obtain separate images of features of the object only on the first side of the

object and features of the object only on the second side of the object as taught by Toh et al in order to image both the right and left portions of the a SOP using a camera.

Regarding claims 5-10; Suzuki discloses the all of features in claimed invention except for an LED system for projecting light of LED onto the opaque divider. However, Toh et al teaches that it is known in the art to provide a light source considered to be an LED system (25A, 25B of figure 11 and it is inherent for using illuminating light source considered to be LED system) for projecting light of LED onto the opaque divider considered to be a transparent guide (77 of figure 11 and col.9 lines 1-10). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine machine vision system of Suzuki with an LED system for projecting light of LED onto the opaque divider as taught by Toh et al in order to provide illuminating light of the device undergoing inspection by the passage of the light through transparent guide.

Regarding claims 12-13; Suzuki discloses the all of features in claimed invention except for the divider having an edge for contacting the major surface of the object wherein the edge of the divider forming an acute angle with respect to major of the object. Toh et al teaches that it is known in the art to provide for the divider (77 of figure 11) having an edge (figure 11) for contacting the major surface of the object (71 of figure 11) wherein the edge of the divider forming an triangle angle (figure 11) with respect to major of the object (71 of figure 11) However, Toh et al does not teach the edge of the divider forming an acute angle with respect to major of the object. It would have been an obvious matter of design choice to an acute angle with respect to major of

the object in combination of machine vision system of Suzuki, since applicant has not disclosed that the limitation "the edge of the divider forming an acute angle with respect to major of the object" solves any state problem or is for any particular purpose and it appears that the invention would perform equally well Toh et al's device with the edge of the divider forming an triangle angle (figure 11) with respect to major of the object (71 of figure 11).

Regarding claims 14-15 and 26-27; Suzuki discloses the all of features in claimed invention except for the object is moved both vertically and horizontally, and a picker for picking and moving the object. However, Toh et al teaches that it is known in the art to provide for the object is moved both vertically and horizontally, and a picker for picking and moving the object (figures 3 and 5). It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine machine vision system of Suzuki with the object is moved both vertically and horizontally, and a picker for picking and moving the object as taught by Toh et al for the purpose of transporting of the IC across the module of the inspection system.

Regarding claim 25; Suzuki discloses a first reflective surface is a prism (15 of figure 5) for obtaining the separate view of only the first side of the object (figure 5) and a second reflective surface is a prism (15 of figure 5) obtaining the separate view of only the second side of the object (figure 5).

Allowable Subject Matter

Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tan et al (6,532,063) discloses 3-D lead inspection; Suzuki et al (6,307,210) discloses device for imaging object to be inspected and device for inspecting semiconductor package; Ikeno (5,864,405) discloses inspection apparatus of electronic component; Shires (6,573,987) discloses LCC device inspection module; Lebeaun et al (5,563,703) discloses lead coplanarity inspection apparatus and method; Tomiya (5,452,080) discloses image inspection apparatus and method; or Pine et al (5,131,753) discloses robotic placement device using compliant imaging surface.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Sang Nguyen whose telephone number (703) 308-6426. The examiner can normally be reached on Monday through Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Frank Font, can be reached on (703)308-4881. The fax phone number for the organization where this application or proceeding is assigned is (703)308-7722 or 7724.

Application/Control Number: 10/099,684
Art Unit: 2877

Page 9

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Nguyen/ sn SN

August 18, 2003



Frank G. Font
Supervisory Patent Examiner
Art Unit 2877
Technology Center 2800